BRIEFS AND BRIEFS

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IN THE

Supreme Court of the United States

BEVERLY R. GILL, et al.,

Appellants,

v.

WILLIAM WHITFORD, et al.,

Appellees.

On Appeal from the United States District Court for the Western District of Wisconsin

BRIEF OF ERIC MCGHEE AS *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

CHRISTOPHER S. ELMENDORF
UNIVERSITY OF CALIFORNIA,
DAVIS SCHOOL OF LAW
400 Mrak Hall Drive
Davis, CA 95616
(530) 752-5756
cselmendorf@ucdavis.edu

DANIEL F. KOLB
Counsel of Record
LYNN E. BUSATH
JOHN HAMMOND HEATH
ELIZABETH A. TIPPETT
DAVIS POLK & WARDWELL LLP
450 Lexington Avenue
New York, NY 10017
(212) 450-4000
Daniel.Kolb@DavisPolk.com

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BRIEF OF ERIC MCGHEE *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

INTEREST OF THE *AMICUS CURIAE*[1]

Amicus curiae Eric McGhee is a political scientist and research fellow at the Public Policy Institute of California ("PPIC"). PPIC is a nonprofit, nonpartisan organization dedicated to informing and improving public policy in California.[2] McGhee developed the "Efficiency Gap" measure of partisan advantage on which the plaintiffs and the court below relied. He holds a Ph.D. in political science from U.C. Berkeley and has published numerous papers in top peer-reviewed journals.

He takes an interest in this case because the plaintiffs and the lower court have relied on his work, and because he wants to ensure that this Court's decision is not based on a misunderstanding of the Efficiency Gap and the other metrics of partisan advantage that may be used in analyzing a map of legislative districts.

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[1] Pursuant to Rule 37.6, *amicus* affirms that no counsel for a party authored this brief in whole or in part and that no person other than *amicus* and its counsel made a monetary contribution to its preparation or submission. The parties' letters consenting to the filing of *amicus curiae* briefs have been filed with the Clerk's office.

[2] McGhee's affiliation with PPIC is given here as biographical information; his findings in this area have not been reviewed or endorsed by PPIC, and PPIC takes no position on the use of this research for any purpose. The views expressed in McGhee's brief in this matter are his personal views, and not those of PPIC.

INTRODUCTION AND SUMMARY OF ARGUMENT

Amicus files this brief on behalf of neither party to explain the Efficiency Gap ("EG") measure of partisan advantage and respond to questions about it. This brief does not argue for or against affirmance of the lower court's decision, nor does it propose a specific doctrinal standard or test for liability. *Amicus*'s aims are purely explanatory.

Part I below provides an introduction to the EG, including an explanation of how the EG relates to measures of partisan symmetry—the relative opportunity for each party to convert votes into seats—previously considered by this Court. The EG may be used in all states, including those that do not have competitive elections. It is an easy-to-calculate, hard-to-manipulate measure of partisan advantage that is grounded both in recognized concepts of political fairness and in our nation's actual history of elections since the adoption of the one person, one vote principle.

Part II responds to objections that have been raised as to the use of the EG. The objections raised are easily met.

Part III explains the conceptual and empirical relationships between the EG and other proposed measures of partisan symmetry. The main takeaways are that the EG has distinct advantages over the other measures and in politically competitive states such as Wisconsin all of the symmetry metrics lead to similar conclusions.

Amicus submits that the EG is a very useful measure of the partisan advantage resulting from a full map of districts for a legislative body. The lower court's reliance on the EG as evidence of partisan

advantage was reasonable, and certainly not grounds for reversal.

ARGUMENT

I. THE EFFICIENCY GAP IS A SIMPLE, HISTORICALLY GROUNDED METRIC OF PARTISAN ADVANTAGE, RESPONSIVE TO CONCERNS THAT JUSTICES OF THIS COURT HAVE RAISED.

The Efficiency Gap is a reliable measure of the effect of a partisan gerrymander for three principal reasons. First, the EG is predicated on the widespread understanding that the whole point of a partisan gerrymander is to distribute opposing-party supporters inefficiently so their votes are not converted into seats while distributing one's own supporters efficiently so their votes are converted into seats.

Second, the EG is a practical, historically grounded implementation of *partisan symmetry*—the relative opportunity for each party to convert votes into state legislative or congressional seats. An EG of zero mathematically indicates symmetry, and, further, that the relationship between the parties' vote shares and seat shares under the map at issue aligns with the historical norm in state legislative and congressional elections.

Several Justices of this Court have expressed interest in using symmetry to guide the evaluation of partisan gerrymandering claims, but also concern that quantification of a map's asymmetry not depend on unrealistic electoral scenarios. *See League of United Latin American Citizens v. Perry (LULAC)*, 548 U.S. 399, 420 (2006) (plurality opinion of Kennedy, J.) ("The existence or degree of asymmetry may in large part depend on conjecture about where possible vote-

switchers will reside . . . . [W]e are wary of adopting a constitutional standard that invalidates a map based on unfair results that would occur in a hypothetical state of affairs."); *id.* at 465 (Stevens, J., concurring in part and dissenting in part); *id.* at 483–84 (Souter, J., joined by Ginsburg, J., concurring in part and dissenting in part); *id.* at 491–92 (Breyer, J., concurring in part and dissenting in part). Addressing that concern, the EG reflects actual election results, and its robustness can be tested with electoral fluctuations typical for the state in question.

Third, calculation of the EG is straightforward. There is little room for expert witnesses to distort it to portray the challenged map in a deceptively good or bad light.

The picture of partisan advantage provided by the EG is a snapshot of a particular election—of votes actually cast and seats actually won or lost. Before invalidating a map, a court may consider evidence of whether and if so how the EG is likely to vary in future elections—or has varied in other elections—held pursuant to the map. Such evidence can be generated using statistical methods that are standard in the political science literature and widely employed by mapmakers who design partisan gerrymanders.

A. The Efficiency Gap Measures the Votes Wasted By Packing and Cracking Opposing-Party Voters Among Legislative Districts.

Presented first in a peer-reviewed academic paper, *see* Eric McGhee, *Measuring Partisan Bias in Single-Member District Electoral Systems*, 39 LEGIS. STUD. Q. 55 (2014) [hereinafter McGhee, *Measuring Partisan Bias*], the EG metric of partisan advantage is grounded

in a very simple and familiar idea: A redistricter seeking partisan advantage distributes voters among districts to increase the number of seats his party will obtain for a given share of the popular vote. Because winning more seats is the point of a partisan gerrymander, a measure that purports to quantify the effect of alleged partisan gerrymanders should classify a map as more advantageous to the redistricting party (relative to some other map) if the map would give the redistricting party more seats for the same share of the vote. *Amicus* calls this the "Efficiency Principle." *See* McGhee, *Measuring Partisan Bias*, *supra*, at 61; Eric McGhee, *Measuring Efficiency in Redistricting*, 16 ELECTION L.J. (forthcoming 2017), *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3007401 [hereinafter McGhee, Measuring Efficiency in Redistricting].

In developing the EG, McGhee built on observations of this Court and many others concerning the two principal ways by which redistricters may increase the number of seats held by their party without an associated increase in their party's popular vote. One is to "crack" groups of opposing-party voters, spreading them among several legislative districts in which they will be outnumbered by voters of the party drawing the map. The other is to "pack" voters of the opposing party into districts that are already likely to be won by opposing-party candidates, increasing those candidates' vote shares while effectively preventing the opposing party from winning more seats.

Whether packed or cracked, such votes are wasted *because they do not contribute to victories*. McGhee, *Measuring Partisan Bias*, *supra*, at 56–57; McGhee, *Measuring Efficiency in Redistricting*, *supra*, at 2–4. *See also Vieth v. Jubelirer*, 541 U.S. 267, 286 n.7 (2004)

(using the terms cracking and packing to characterize partisan gerrymanders); *Davis v. Bandemer*, 478 U.S. 109, 116–17 n.6 (1986) (stacking and cracking). A successful gerrymander will saddle the opposing party with more wasted votes than the mapmakers' party, thereby garnering more legislative seats for the party in control.

The EG quantifies the relative difference in the parties' wasted votes. It sums across all the districts in the map (1) the number of votes cast for each party's losing candidates, and (2) the number of votes cast for each party's winning candidates in excess of the 50% that assures victory.[3] The first sum captures gerrymandering by cracking, the second, gerrymandering by packing.

Next, a party's wasted-vote total is subtracted from the other party's wasted-vote total, and the difference is divided by the total number of votes in the election. The result—the EG—is the difference in wasted votes as a percentage of the total vote. Restated in math notation:

$$EG = \frac{\sum(\text{Party X wasted votes}) - \sum(\text{Party Y wasted votes})}{\sum(\text{Party X votes} + \text{Party Y votes})}$$

To illustrate, if there are 100,000 voters in a district and 55,000 vote for the Democratic candidate while

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[3] Arguably, votes for the winner are not wasted except insofar as the winner's vote share exceeds 50% + 1, rather than 50%. This minor modification of the formula is inconsequential for real-world maps of legislative districts, with tens of thousands of voters per district. Either version of the formula satisfies the Efficiency Principle. *See generally* McGhee, *Measuring Efficiency in Redistricting*, *supra*.

45,000 back the Republican, the outcome of the race contributes 45,000 wasted votes to the Republican sum, 5,000 wasted votes (55,000-50,000) to the Democratic sum, and 100,000 votes to the denominator.

The EG can be calculated from the perspective of either party, i.e., with "Democrats" or "Republicans" as Party X in the above expression. When lawyers and commentators talk about whether the EG is "large" or "small," they are referring to the absolute value of the EG. Because such discussions about size are always about the absolute value of the EG, it does not matter which party's wasted vote total is used as the first term or the second term in the numerator of the EG.

As a sum across districts, the EG quantifies the *total or aggregate* partisan advantage conferred by a map of legislative districts, rather than how much a *particular district* benefits either party. To crack and to pack is to shift voters *among* districts; accordingly, any measure of the effect of a partisan gerrymander must account for the distribution of voters *among* districts, not simply the characteristics of a single district viewed in isolation. In layman's terms, the EG is simply the net impact of packing and cracking across all the districts in a map.

B. The Efficiency Gap's Implementation of the Concept of "Partisan Symmetry" Is Historically Grounded and Does Not Depend on Implausible Hypotheticals.

There is an important relationship between the EG and the concept of partisan symmetry. Long used by political scientists to define fairness in two-party systems, the concept of partisan symmetry was addressed by the Justices of this Court in *LULAC*. The EG employs the idea of partisan symmetry in a tractable,

historically grounded manner that responds specifically to Justice Kennedy's critique in *LULAC* of the then-available symmetry metric.

A map of legislative districts is considered symmetric, as political scientists use the term, if it is expected to reward each party with the same share of seats for a given share of the two-party popular vote. Symmetry so defined is indifferent to what political scientists call *responsiveness*, that is, to the rate at which seats switch hands as the parties' vote shares shift. Any level of responsiveness is compatible with symmetry, as symmetry merely means (1) that each party enjoys the same seat share for a given vote margin above 50%, and (2) that each party obtains 50% of the seats if both parties get 50% of the vote.

To identify the expected or usual relationship between votes and seats under a particular map of legislative districts, analysts will often shift (hypothetically) a party's vote share in every seat up or down by the same amount and record the party's new seat share given this shift. If this exercise is repeated for all possible vote shares, the hypothetical vote shares and seat shares can be plotted against each other in a "votes-to-seats" curve. (*See* Part III, *infra*, for illustrations.) The votes-to-seats curve is a useful tool for understanding how a redistricting plan is likely to drive results under circumstances that have not occurred.

However, while this votes-to-seats curve is useful for thinking about symmetry in the abstract, no political party will ever experience the full range of vote shares from 0 to 100 percent, in a given state and over the lifetime of a given map. The votes-to-seats curve is empirically grounded only *for vote shares within the*

recent range of variation in actual vote shares in the state.

Recognizing as much, analysts do not usually quantify the curve's asymmetry over the full span from a vote-share of 0% to a vote share of 100%. Instead, they focus on the most normatively significant point—a vote share of 50%—and estimate the seat shares that each party would likely receive when they earn the same share of the statewide vote. The difference between either party's seat share and 50% at this point is called "partisan bias" or "Gelman-King bias." *See, e.g.*, Andrew Gelman & Gary King, *A Unified Method of Evaluating Electoral Systems and Redistricting Plans*, 38 AM. J. POL. SCI. 514, 536 (1994). Gelman-King bias was briefed in *LULAC*. *See* Brief of *Amici Curiae* Professors Gary King et al., in Support of Neither Party 14–15, *LULAC*, 548 U.S. 399 (No 05-204), 2006 WL 53994 (suggesting legal standard based on estimated seat-share difference at 50% vote share).

Yet the Gelman-King measure may still depend on hypothetical electoral scenarios with little basis in real-world voting patterns. For example, in a state where Republicans regularly win about 65% of the two-party vote in state legislative elections, Gelman-King bias requires a prediction about the number of seats that Democrats would carry if the parties' vote shares were significantly different from the actual balance of party voter percentages—e.g., if each party won 50% of the vote. Such dramatic, short-term partisan reversals are fanciful. They exist only in imagined realms of unheard-of calamity or radically overhauled party platforms and leadership. It's anyone's guess *which* voters would switch sides in these scenarios. Yet without predictions about the geographic distribution of vote-switchers, there's no way to predict how

many seats would be won by each party in the counterfactual election. *See LULAC*, 548 U.S. at 419–20 (Kennedy, J. articulating such concerns).

Acknowledging the force of these objections, proponents of the Gelman-King measure have confirmed that it should only be used in competitive states, i.e., where each major party usually receives close to 50% of the two-party vote. *See* Bernard Grofman & Gary King, *The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering after* LULAC v. Perry, 6 ELECTION L.J. 2, 31 (2007); Andrew Gelman & Gary King, *Enhancing Democracy Through Legislative Redistricting*, 88 AM. POL. SCI. REV. 541, 545 (1994). But this limitation puts courts in the awkward position of making case-by-case determinations of whether a state is sufficiently competitive for the metric of partisan advantage to be used.

The EG offers a ready solution to this problem. It is a version of symmetry that uses actual election outcomes—the votes actually cast and the seats actually won in any state. It does not depend on fanciful hypotheticals at all.[4] Simple algebra establishes that an EG of zero will be observed if and only if the parties' vote shares and seat shares in an election correspond to a point on the line which passes through the 50% vote, 50% seats point and has a slope of 2. *See* McGhee, *Measuring Partisan Bias*, *supra*, at 79–80. This line is symmetrical with 2:1 responsiveness, meaning that for every 1% increase in a party's vote share above

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[4] Analysts do consider hypotheticals when investigating the durability of the observed EG, and in districts where seats are uncontested. But these inquiries are grounded in the observed range of variation in the state, in contrast to the counterfactuals sometimes required to calculate Gelman-King bias. *See infra* Part I.D.

50%, that party secures an additional 2% of the legislative seats. Thus, *an EG of zero means that the election results accord with partisan symmetry*—without requiring estimation of a hypothetical votes-to-seats curve.

Two-to-one responsiveness is not a strange anomaly. The existence of a "winner's bonus" is a well-known feature of single-member district, plurality-winner electoral systems. *See, e.g.*, Grofman & King, *supra*, at 9; *Vieth*, 541 U.S. at 357–58 (Breyer, J., dissenting). The 2:1 relationship reflected in an EG of zero is a particularly helpful guidepost because it corresponds to the *actual historical relationship between votes and seats in American elections* in the one person, one vote era.

To assess this relationship, plaintiffs' expert Simon Jackman, then a tenured professor at Stanford University,[5] analyzed the canonical dataset[6] of post-malapportionment redistricting maps, compiled by experts and covering nearly all states from 1972 to the present. *See* Simon Jackman, *Assessing the Current Wisconsin State Legislative Districting Plan, Whitford v. Gill*, No. 15-cv-421-bbc (W.D. Wis. Nov. 21, 2016) [hereinafter Jackman Wisconsin Report] at 33 fig. 11. He calculated vote and seat shares for every election held under each map, and the results cluster neatly around the votes-to-seats curve implied by an EG of zero. There are some outliers, but for the most part, the historical practice of districting in the United States has produced roughly symmetric maps with

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[5] Jackman is now CEO of the United States Studies Centre at the University of Sydney, in his home country of Australia.

[6] State Legislative Election Returns (1967–2010), Inter-University Consortium for Political and Social Research, *available at* http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34297, Study No. 34297.

2:1 responsiveness. This finding is uncontested. *See Whitford v. Gill*, 218 F.Supp.3d 837, 904 (2016).

In *Vieth*, 541 U.S. 267, Justice Kennedy posited that litigants might in a future partisan gerrymandering case uncover "historical guidance" that would shed light on appropriate standards. *Id.* at 308–09 (Kennedy, J., concurring in judgment). He also noted that "new technologies may produce new methods of analysis that make more evident the precise nature of the burdens gerrymanders impose on the representational rights of voters and parties." *Id.* at 312–13. The record in this case bears out Justice Kennedy's hope. The plaintiffs relied on a new technology (the EG metric), and they developed a record that is based on the actual history of United States elections. This history shows that the EG is grounded in a well-rooted (though previously unarticulated) tradition concerning the relationship between a major party's support in the electorate and its share of seats in the legislature.

C. The Efficiency Gap Is Calculated Using Familiar Concepts, Methods, and Data Sources, and Is Not Easily Manipulated.

The reliability of the EG as a measure of partisan advantage is further indicated by the lack of disagreement among expert witnesses as to its calculation. In the present case, defendants' experts did not challenge the EG calculations at all. In the North Carolina case, *League of Women Voters of North Carolina v. Rucho*, No. 1:16-CV-1026, 2017 WL 876307 (M.D.N.C. 2017), defendants' expert was able to show EG results quite different than the plaintiffs'—but only by erroneously defining the EG as the deviation from proportional representation. *See* Simon Jackman, Rebuttal Report, *League of Women Voters of North Carolina v. Rucho*,

No. 1:16-CV-1026 (M.D.N.C. 2017) at 9–10 [hereinafter Jackman, *Rucho*, Rebuttal Report] (showing convergence of defense-side and plaintiff-side calculations upon correction of this definitional error).

It is true that calculation of the EG is not entirely mechanical, but expert witnesses have very limited discretion. Discretion may enter at two points. First, for ease of computation and because of data limitations, experts sometimes use a simplified approximation of the full EG formula; the simplified version is only exactly correct if the number of votes is constant across districts and no one votes for third-party or independent candidates.[7] But because the number of voters does not vary greatly across districts, and because minor party and independent candidates rarely garner many votes, the simplified EG is extremely highly correlated with the "full" version. *See* McGhee, *Measuring Efficiency in Redistricting*, *supra*, at 40–43.[8] As a defense expert stated in this case, the simplified method provides "'an appropriate and useful summary.'" *Whitford*, 218 F.Supp.3d at 907.

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[7] The simplified formula is: *EG* ≈ (*Party X Seat Margin*) – 2 * (*Party X Vote Margin*). The seat margin is the party's percentage of legislative seats, minus 50%; the vote margin is the party's percentage of the total statewide vote in legislative elections, minus 50%. *See* McGhee, *Measuring Partisan Bias*, *supra*.

[8] *Amicus* has developed a slightly revised version of the formula that is more appropriate when turnout deviations are significant. In this version the baseline 2-to-1 seats-to-votes ratio is maintained and the substantive implications of the measure are very similar. As noted, for American elections generally and the Wisconsin plan in particular, all versions of the EG are highly correlated with each other. *See* McGhee, *Measuring Efficiency in Redistricting*, *supra*.

Second, it is best practice to calculate the EG using "imputations" for the two-party vote in uncontested seats, and different experts may use slightly different imputation methods. *See generally* Nicholas Stephanopoulos & Eric McGhee, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. CHI. L. REV. 831, 850–53 (2015); McGhee, *Measuring Partisan Bias*, *supra*.[9] The imputed two-party vote for a district represents the expected vote if the seat had been contested. In theory, one could compute the EG using actual vote totals in districts where the incumbent went unchallenged. But that would be tantamount to saying that supporters of the out-of-power party who have been "cracked" into districts held by strong, unchallenged incumbents of the gerrymandering party were not in fact rendered impotent—even though a protest, write-in vote would have been pointless, and even though their vote would have been tabulated as wasted if a challenger had run and lost. Imputation allows the EG to account for votes that probably would have been wasted had a challenger run.

The imputed vote for a legislative district is based on the actually observed relationship in a state between the district-level vote shares of partisan candidates in statewide elections and the vote shares of legislative candidates running to represent the district. The associated methods are standard in the statistical literature,[10] and generally accepted methods

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[9] Imputation is also used when computing other measures of partisan bias. *See, e.g.*, Andrew Gelman & Gary King, *A Unified Method of Evaluating Electoral Systems and Redistricting Plans*, 38 AM. J. POL. SCI. 514, 549–50 (1994).

[10] *See generally* RODERICK J. A. LITTLE & DONALD B. RUBIN, STATISTICAL ANALYSIS WITH MISSING DATA (2d ed. 2014); Eric McGhee, Memo to the Indiana Legislature on Efficiency Gap

yield very similar EG estimates. *See, e.g.*, Jackman, *Rucho*, Rebuttal Report, *supra*, at 9–10 (showing convergence of EG calculations by different experts); *id.* at 16–17 (reporting 98% correlation between EGs calculated using different imputation approaches). Notably, none of the defense-side experts in this or the North Carolina case where the EG was offered questioned the imputations.

D. Because the EG Provides a Snapshot Picture of Relative Wasted Votes, Assessments of Partisan Fairness Benefit From Further Analysis.

The EG is calculated using actual outcomes in a given election. The number of votes deemed wasted for each party in a district depends on which candidate actually won that seat, and, save for uncontested seats, on the actual number of votes cast for each party's candidate in that district.[11] The EG thus provides an election-specific "snapshot" picture of relative wasted votes. This snapshot helps to establish that the "feared inequality" is not "hypothetical," *see LULAC*, 548 U.S. at 420 (plurality opinion of Kennedy, J.), but before invalidating a map, courts should determine from the evidence whether a large observed EG is likely to persist. *See Whitford*, 218 F.Supp.3d at 898–910; Stephanopoulos & McGhee, *supra*, at 887–90. If a large EG was simply the result of one party having a

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Imputations, Aug. 5, 2016, *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3007178.

[11] Even when the "simplified" method is used, the EG relies on actual election results; the simplified method just uses statewide totals (seat margin, and legislative vote margin) rather than summing wasted votes on a seat-by-seat basis. *See supra* Part I.C.

good year and sweeping all the competitive districts, there would be no reason for a court to step in.

To gauge persistence of partisan advantage, expert witnesses perform *sensitivity tests*.[12] (Gerrymanderers do too.[13]) A sensitivity test is a statistical projection of potential future election results, grounded in the historically observed range of variation in elections in the state. Professor Jackman's sensitivity tests below indicated, and the district court found, that the pro-Republican EG in the Wisconsin map was very likely to persist throughout the decennial period. *Whitford*, 218 F.Supp.3d at 905–06. This finding is hardly a surprise, given that sensitivity tests conducted by the expert whom the Wisconsin redistricters hired to evaluate potential maps reached the same conclusion. *See id.* at 857–58.

Judicial inquiries into partisan fairness might also consider the *expected EG*: the EG as the map-maker sees it, with an eye to the future but without knowing which election years will be banner years for each party, which incumbents will die or retire, and which seats will be contested by strong challengers. The expected EG is simply the predicted EG under a range of electoral scenarios, weighted by the likelihood of those scenarios.[14] Calculating the expected EG is just

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[12] The district court used the term "swing analysis" to describe sensitivity tests. *See Whitford v. Gill*, 218 F.Supp.3d 837, 899–905 (2016).

[13] An expert hired by the firm that designed the map at issue in this case carefully investigated how proposed plans would likely "perform" for the Republican Party under a range of vote-share scenarios. *See Whitford*, 218 F.Supp.3d at 857–58.

[14] Because the expected EG accounts for the range of electoral scenarios, it won't be thrown off by the idiosyncrasies of any given election, such as which candi..ates opted to run, what strategies

like calculating the realized EG, except that the two-party vote is imputed for *every* seat, not just the uncontested ones.[15] This kind of analysis is common for those who draw gerrymandered maps.[16]

The expected EG measures the *opportunity* to secure representation under a given map (i.e., the field on which the political parties do battle), whereas the realized EG measures *outcomes* (i.e., the results of the battle—votes cast and seats won or lost). Though *amicus* takes no position on whether the expected EG should be used in a given case, he observes that in related contexts, courts have often favored such opportunity-based standards. *See, e.g.*, *Johnson v. De Grandy*, 512 U.S. 997, 1013–14 & n.10 (1994) (distinguishing opportunity and outcome standards for vote-dilution claims under the Voting Rights Act, and expressly rejecting the latter); *Frank v. Walker*, 768 F.3d 744, 748–49, 752–54 (7th Cir. 2014) (Easterbook, J.) (defending opportunity-not-outcome standards for "vote denial" cases under the Equal Protection Clause and the Voting Rights Act).

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they pursued, and the ups and downs of presidential and gubernatorial approval ratings.

[15] The expected EG was calculated for a pending case in North Carolina, which was brought before any elections had been held under the map at issue. The forecasts used in pre-election calculations proved to be extremely accurate. *See* Simon Jackman, *Rucho*, Rebuttal Report, *League of Women Voters of North Carolina v. Rucho*, No. 1:16-CV-1026 (M.D.N.C. 2017) at 16 [hereinafter Jackman, *Rucho*, Rebuttal Report] ("[T]he efficiency gap predicted . . . for an electoral environment like that of 2016 was accurate to within a percentage point.").

[16] *See supra* note 9.

II. THE OBJECTIONS TO THE EFFICIENCY GAP AS A MEASURE OF PARTISAN ADVANTAGE ARE EASILY MET.

It has been said that the EG rests on a mistaken conception of wasted votes; that it is excessively or misleadingly volatile; that it fails to account for democratic values other than partisan symmetry; that it is "biased" toward the Democratic Party; and that it requires proportional representation. These objections are easily met.

A. The Efficiency Gap Does Not Rest on a Mistaken Conception of Wasted Votes.

Some critics maintain that no summary measure of wasted votes should be used to gauge the effect of a partisan gerrymander because all votes have *some potential* to affect the representative's behavior. Because of this, the critics say, there simply is no identifiable class of "wasted" votes. *See* Brief for Appellants at 49–50, *Whitford v. Gill*, 218 F.Supp.3d 837 (2016) [hereinafter Appellants' Brief]; Brief of *Amici Curiae* Wisconsin State Senate and Wisconsin State Assembly in Support of Appellants 18–19, *Whitford v. Gill*, 218 F.Supp.3d 837 (2016) (No. 16-1161), 2017 WL 1506064. Other critics accept the idea of tabulating wasted votes, but argue that the EG equation uses an incorrect definition or standard to summarize relative wasted votes. *See, e.g.*, *Whitford*, 218 F.Supp.3d at 957–59 (Griesbach, J., dissenting) (arguing that votes for the winner should be deemed "wasted" insofar as the winner's vote share *exceeds that of the runner-up*, rather than 50%); *cf.* McGhee, *Measuring Efficiency in Redistricting*, *supra* (investigating this and other proposed revisions to the EG formula). Neither objection has merit.

The all-votes-may-have-influence argument overlooks the fact that winning more seats without winning over more voters is the point of a partisan gerrymander. The EG is thus grounded in the Efficiency Principle: Any measure of partisan effect must indicate a greater advantage for a party when the seat share for that party increases without any corresponding increase in its vote share. *See* Part I.A, *supra*. Indeed, it is precisely because votes cast by legitimate voters are valued in a democracy that normative concerns are raised if one party's votes are devalued because they are less effectively converted into seats than another party's votes due to partisan gerrymandering. As Justice Kennedy noted in *Vieth*, "The inquiry . . . is whether political classifications were used to burden a group's representational rights." *Vieth* 541 U.S. at 315. In the absence of some "compelling interest," *id.*, that concern is not ameliorated because the votes, although devalued in terms of winning seats (the partisan gerrymanderer's concern), might still have some value in influencing an office holder of the opposing party.

Moreover, the "all-votes-may-have-influence" argument elevates a theoretical possibility above everything that is actually known about elections and representation.[17] A legislator's margin of victory has very little effect on how she or he votes on bills; by contrast, the effect of replacing a Democratic legislator with a

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[17] The theoretical possibility is not legally determinative. Though a plurality of this Court once treated the presumption that voters who support the losing candidate have influence over the winner as a reason not to strike down partisan gerrymanders, that plurality also recognized that the presumption is subject to "actual proof." *See Davis v. Bandemer*, 478 U.S. 109, 131–32 (1986).

Republican or vice versa is huge, holding constant district characteristics. *See, e.g.*, Stephen Ansolabehere et al., *Candidate Positioning in U.S. House Elections*, 45 AM. J. POL. SCI. 136 (2001); Barry C. Burden, *Candidate Positioning in US Congressional Elections*, 34 BRIT. J. POL. SCI. 211 (2004); Devin Caughey et al., *Partisan Gerrymandering and the Political Process: Effects on Roll-Call Voting and State Policies*, 16 ELECTION L.J. (forthcoming 2017), *available at* http://cwarshaw.scripts.mit.edu/papers/CTW_efficiency_gap_170515.pdf (May 15, 2017); David S. Lee et al., *Do Voters Affect or Elect Policies? Evidence from the U.S. House*, 119 Q.J. ECON. 807 (2004); Nolan McCarty et al., *Does Gerrymandering Cause Polarization?*, 53 AM. J. POL. SCI. 666, 671 fig. 3 (2009); Keith T. Poole, *Changing Minds? Not in Congress!*, 131 PUB. CHOICE 435 (2007).

Lack of representation for citizens who vote for the losing candidate extends even to rudimentary matters of constituent service. In just the past few years, data vendors have revolutionized campaigns by merging official state voter files with consumer databases, creating estimates of the partisanship and turnout propensities of every registered voter. *See generally* DANIEL KREISS, PROTOTYPE POLITICS: TECHNOLOGY-INTENSIVE CAMPAIGNING AND THE DATA OF DEMOCRACY (2016); EITAN HERSH, HACKING THE ELECTORATE: HOW CAMPAIGNS PERCEIVE VOTERS (2015). Sophisticated legislators are now using such estimates to screen constituent inquiries, disregarding citizens whom the data vendors classify as unlikely to vote for the incumbent. *See* HERSH, *supra*, at 200–05.

Some critics have asserted a related point: that voters make complex decisions but the EG assumes they only care about parties. *See, e.g.*, Brief of *Amici*

Curiae The Republican National Committee and the National Republican Congressional Committee in Support of Appellants 41–50, *Whitford v. Gill*, 218 F.Supp.3d 837 (No. 16-1161), 2017 WL 1548280 [hereinafter RNC Amici Brief]. This is incorrect. The EG does not ignore independent or swing voters. Rather it requires that neither party be forced to win over more of them to avoid a "wasted vote" deficit. Moreover, the sensitivity testing described above can explore the consequences of significant nonpartisan voting behavior, should evidence of such behavior emerge in the future.

As for the criticism that the EG formula uses an incorrect definition to summarize relative wasted votes, *amicus* has for a forthcoming article investigated proposed reformulations, including Judge Griesbach's argument that votes cast for the winner should be counted as wasted to the extent that they exceed the second-place candidate's vote share (rather than 50%). *See* McGhee, *Measuring Efficiency in Redistricting*, *supra*. *Amicus*'s analysis shows that the reformulations would imply a level of responsiveness (in the translation of votes into seats) that deviates from the 1 2 votes-to-seats curve historically typical of American elections, and would be far less consistent with the Efficiency Principle. It follows that a legal standard resting on Judge Griesbach's preferred definition of wasted votes could disrupt American electoral traditions, while doing a poor job of identifying maps that distribute opposing-party voters for maximum partisan advantage.

Judge Griesbach's argument also elides the fact that in our essentially two-party system a candidate cannot be sure of winning without 50% of the vote because votes *not* cast for the candidate of one party are almost

always cast for the candidate of the other party. Unlike Judge Griesbach's baseball example based on runs not vote percentages, a Republican who wins with 52% of the vote to the Democratic opponent's 48% would likely have lost had the Republican's vote share fallen to 48%. To similar effect, if Republicans comprising 4% of the district had been moved into another district and replaced with non-Republican voters, the Republican candidate almost surely would have lost. The 50% threshold embodied in the EG formula indeed has "special significance[] in the democratic process." *Bartlett v. Strickland*, 556 U.S. 1, 19 (2009) (plurality opinion of Kennedy, J.).

B. The Putative Volatility of the Efficiency Gap Is a Feature, Not a Flaw.

Like a number of commentators, Judge Griesbach has challenged the EG because it may vary from election to election, particularly under maps in which there are many competitive districts. *See Whitford*, 218 F.Supp.3d at 959–62 (Griesbach, J., dissenting); *see also* Appellants' Brief, *supra*, at 51–52.

This objection reflects a failure to appreciate two very fundamental points. First, *any* measure of partisan advantage that takes account of *which party actually wins seats* has some potential to vary from election to election, particularly if the map in question has a substantial number of competitive districts.[18] Such

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[18] When the number of legislative districts is very small, the standard percentage form of the EG should be converted to raw seats to avoid exaggerating either the size or volatility of the bias in the plan. For example, in a two-seat plan a party can increase its seat share (and so its EG) by 50% by winning just one more seat. It would be better to present this change as the one-seat shift that it is. Small-seat plans like this are easily identified and managed in any potential litigation. *Cf.* Stephanopoulos &

"volatility" simply reflects actual partisan advantage in given elections.

Second, no proponent of judicial action as to partisan gerrymanders maintains that a legislative map should be deemed constitutionally suspect *merely* on the basis of the EG observed in a single election. It is important to confirm through sensitivity testing that the EG is likely to be *durable*.[19] *See* Stephanopoulos & McGhee, *supra*, at 887–90; *Whitford*, 218 F.Supp.3d at 898–910.

In sum, the so-called volatility of the EG simply reflects realities on the ground that vary from election to election. Far from being a weakness, it is actually a safeguard against excessive judicial involvement in partisan gerrymandering cases, relative to measures that might lead courts to think that an observed partisan asymmetry is more stable than it actually is.

C. The Efficiency Gap Does Not Account for All Democratic Values—Nor Should It.

The EG has been faulted for its failure to account for certain democratic values. Judge Griesbach observed, for example, that the EG "counts" all districts equally (a wasted vote is a wasted vote, regardless of the district in which it was cast), whereas as a functional matter the *median district* is more important than the others. *See Whitford*, 218 F.Supp.3d at 952–53. And he pointed out that large EGs could materialize for

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McGhee at 887–89 (proposing a two-seat threshold for cases about congressional redistricting).

[19] The volatility objection would also vanish if courts grounded liability rulings on the expected EG, rather than the realized EG. *See supra* Part I.D.

entirely legitimate reasons, as may occur if districts were drawn for congruence with political subdivision boundaries in a state where supporters of one political party happened to be more efficiently distributed with respect to those boundaries than supporters of the other party. *Id.* at 962–63.

Such objections are easily met because the EG only measures partisan symmetry, not everything that might be deemed good or bad about a map of legislative districts. The argument that the EG "fails to account for everything" just restates the principal argument against judicial intervention in the malapportionment cases, namely, that because the equal-population norm is not the *exclusive* consideration in designing maps for fair and effective representation, the norm should not be judicially enforced *at all*. *See Baker v. Carr*, 369 U.S. 186, 301–24 (1962) (Frankfurter, J., dissenting). The argument is no stronger today than it was in 1962.

To address potentially competing values, courts may construct a framework under which other values can *justify* legislative maps that deviate substantially from the equality norm. *Amicus* takes no position on what the substantial-asymmetry trigger for heightened scrutiny should be, or on what state interests are weighty enough to justify large asymmetries.

Similarly, if courts conclude that there is no reason to intervene unless the plaintiff political party would have some chance of winning the median district under a fair map, courts could require plaintiffs to prove *both* substantial partisan bias under the challenged map and potential-majority status under an unbiased map.

D. The Efficiency Gap Is Not Biased Toward Democrats.

It has been suggested that the EG's appealing veneer conceals a biased mechanism for indicting Republican gerrymanders while insulating Democratic gerrymanders from scrutiny. *See* Appellants' Brief, *supra*, at 50–51; RNC Amici Brief.

Notably, those who assert that the EG is "biased" toward Democrats haven't actually shown or even advanced a theory as to how EG calculation could lead to exaggerated estimates of the partisan asymmetry of Republican gerrymanders and deflated estimates of the partisan asymmetry of Democratic gerrymanders.[20] Nor is it the case, historically, that the EG has shown a consistent Republican advantage in enacted maps. In the 1970s and 1980s (when the RNC favored judicial policing of partisan gerrymanders, contrary to its position today[21]) enacted maps generally had a pro-Democratic EG, whereas recent maps have tended to favor Republicans (hardly surprising given Republican control of state legislatures). *See* Stephanopoulos & McGhee, *supra*, 882–84 fig. 8; Jackman Wisconsin Report, *supra*, at 44. The EG also suggests that

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[20] They rely instead on hypothetical examples of imaginary gerrymanders under utterly implausible political conditions. *Compare* Brief of *Amici Curiae* The Republican National Committee and the National Republican Congressional Committee in Support of Appellants 16–22, *Whitford v. Gill*, 218 F.Supp.3d 837 (No. 16-1161), 2017 WL 1548280 (presenting hypothetical example from the defendants' expert in pending North Carolina case), *with* Jackman, *Rucho*, Rebuttal Report, *supra*, at 14–16 (explaining the ridiculous features of this example).

[21] *See* Brief Amicus Curiae of the Republican National Committee in Support of Appellees *3–8, *Davis v. Bandemer*, 478 U.S. 109 (1986) (No. 84-1244), 1985 WL 670030.

Democratic and Republican gerrymanders are equally effective: Redistricting under unified Democratic control shifts the EG in the pro-Democratic direction by about the same amount as redistricting under unified Republican control shifts the EG in the pro-Republican direction. *See* Nicholas Stephanopoulos, *The Causes and Consequences of Gerrymandering*, 59 WM. & MARY L. REV. figs. 1 & 2 (forthcoming 2017), *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2990638; *see also* Nicholas O. Goedert, *Gerrymandering or Geography? How Democrats Won the Popular Vote but Lost the Congress in 2012*, RES. & POL., Apr.–June 2014.[22]

To the extent those arguing "Democratic bias" have a discernible theory, it is not about the EG per se, but about the very concept of partisan symmetry. The argument is that the fairness (for equal protection purposes) of a map should not be gauged by symmetry—i.e., an equal chance for left-of-median and right-of-median voters to secure a legislative majority—but instead by "traditional" districting principles such as compactness and contiguity with political subdivision boundaries. *See, e.g*, Appellants' Brief, *supra*, at 50–51 (arguing against a "zero-gap baseline"); RNC Amici Brief, *supra*, at 8–14. This issue goes beyond the scope of this brief, though there are good reasons for this Court to choose the symmetry norm,[23] while

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[22] Similar results on the effects of unified control have been found using other measures of partisan symmetry. *See* Andrew Gelman & Gary King, *Enhancing Democracy Through Legislative Redistricting*, 88 AM. POL. SCI. REV. 541, 553 (1994); Richard G. Niemi & Simon Jackman, *Bias and Responsiveness in State Legislative Districting*, 16 LEGIS. STUD. Q. 183, 195 (1991).

[23] Justice Kennedy in *Vieth* warned against legal standards that valorize compactness and contiguity with subdivision boundaries because such criteria could "benefit one political party over

embedding that norm within a doctrinal framework that allows states to justify deviations as may be reasonably necessary to achieve other legitimate objectives.

E. The Efficiency Gap Does Not Require Proportional Representation.

Appellants' objection that the EG requires proportional representation confuses two potential meanings of the term "proportional representation." *See* Appellants' Brief, *supra*, at 49–50. The classical or Millian usage denotes an electoral system in which small groups of citizens who share an interest can band together and secure a fraction of legislative seats approximately equal to the group's share of the voting-eligible population. *See* JOHN STUART MILL, CONSIDERATIONS ON REPRESENTATIVE GOVERNMENT 146 (Prometheus Books 1991) (1861) ("In a really equal democracy, *every or any section* would be represented [with seats in the legislature], not disproportionately, but proportionately. . . . Man for man, [minorities] would be as fully represented as the majority."). Though the Millian usage remains standard, one might also use "proportional representation" to describe any electoral system in which there exists *some usual relationship* between a

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another." *Vieth v. Jubelirer*, 541 U.S. 267, 308–09 (2004) (Kennedy, J., concurring in judgment). The normal-map alternative to the "zero-gap baseline" is vulnerable to Justice Kennedy's objection because it could result in judicial invalidation of symmetric maps when applied to a state where one party's voters are more efficiently distributed than the other's. For example, a zero-EG plan in a state where the putatively normal maps favored Republicans by 10% would, as a matter of law, have a pro-Democratic "bias" of 10% (the difference between the EG of the enacted map, zero, and the typical EG of putatively normal maps, 10%).

political party's vote shares and seat shares. Appellants and Judge Griesbach invoke the latter conception when they criticize the EG for implying a 2:1 "winner's bonus," i.e., seat margins about twice as large as vote margins. *See Whitford*, 218 F.Supp.3d at 947–51 (Griesbach, J., dissenting); Appellants' Brief, *supra*, at 49–50.

By contrast, this Court, in the many cases in which it has "set its face against the claim . . . that the Constitution somehow guarantees proportional representation," *City of Mobile, Ala. v. Bolden*, 446 U.S. 55, 79 (1980) (plurality opinion), has consistently used the term in the standard Millian sense. *See, e.g.*, *Whitcomb v. Chavis*, 403 U.S. 124, 156 (1971) (reversing district court's constitutional vote dilution holding, on the ground that the lower court's decision "[expressed] the proposition that *any group with distinctive interests* must be represented in legislative halls if it is numerous enough to command at least one seat") (emphasis added); *Bolden*, 446 U.S. at 75–80 (discussing *Whitcomb*—and the prospect of various and sundry vote-dilution claims from, e.g., "union oriented workers, the university community, [and] religious or ethnic groups"—in rejecting the notion that *Reynolds v. Sims*' (377 U.S. 533 (1964)) recognition of a right to "equally effective voice" implies "proportional representation as an imperative"); *Bandemer*, 478 U.S. at 145–47 (O'Connor, J., concurring in the judgment) (positing if partisan gerrymandering claims were justiciable, this would lead to a guarantee of "rough proportional representation for *all political groups*," and an unmanageable proliferation of claims from "political, religious, ethnic, racial, occupational, and socioeconomic groups") (emphasis added); *Vieth*, 541 U.S. at 288 (plurality opinion) ("[The Constitution] nowhere says that farmers or urban dwellers, Christian

fundamentalists or Jews, Republicans or Democrats, must be accorded political strength proportionate to their numbers.").

Nothing about the EG or other proposed symmetry metrics would favor proportional representation in the Millian sense. To the contrary, as Part I.B of this brief explained, an EG of zero implies not proportional representation but the very winner's bonus that has been historically typical of United States elections.

It is possible that if this Court upholds the lower court's decision, minor parties might start bringing partisan-gerrymandering claims. But the EG metric wouldn't do them any good. In a forthcoming publication, *see* McGhee, *Measuring Efficiency in Redistricting*, *supra*, *amicus* shows that the EG can be extended to a world in which minor parties win a non-trivial share of the vote, but this extension of the EG does not indicate "bias" against minor parties—even from a complete lack of legislative seats—unless the party wins a share of the vote that far exceeds what minor parties have historically achieved in U.S. elections.[24]

III. THE EFFICIENCY GAP IS CLOSELY RELATED TO THE OTHER MEASURES OF PARTISAN SYMMETRY, BOTH ARITHMETICALLY AND EMPIRICALLY.

Appellants fault respondents for encouraging courts to consider a supposed "hodgepodge" of metrics of partisan bias or symmetry. Appellants' Brief, *supra*, at 45–48. This is said to leave district courts with

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[24] Formally, there is no EG bias against the party (from a lack of seats) until the party wins a fraction of the statewide vote in excess of $1/2k$, where k is the number of parties.

unbounded discretion to "pick a winner" in each case. *Id.* at 46–47. But all the metrics are tied together by a common concept—the neutral principle of partisan symmetry—and the metrics are arithmetically related to one another and highly correlated in politically competitive states like Wisconsin. What social science has produced is not a "hodgepodge" but a set of closely related analytical tools for measuring a common concept.

A. Arithmetically, the Symmetry Metrics Are Closely Related to One Another.

Scholars have variously measured partisan symmetry with Gelman-King bias, discussed in Part I.B above; the EG; the "mean-median difference," which is the gap between a party's mean district-level vote share and its median district-level vote share;[25] and the "average winner's margin difference," which is the difference between the average margin of victory of the winning candidates of each party.[26]

The most salient difference among these metrics is that the EG can be used to evaluate maps in non-competitive states, while the Gelman-King and mean-median metrics would depend on fanciful counterfactuals in such states.[27] For that reason the proponents of Gelman-King recommend using it only in competitive states. *See supra* Part I.B.

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[25] Michael D. McDonald & Robin E. Best, *Unfair Partisan Gerrymanders in Politics and Law: A Diagnostic Applied to Six Cases*, 14 ELECTION L.J. 312, 316 (2015).

[26] Samuel S.H. Wang, *Three Tests for Practical Evaluation of Partisan Gerrymandering*, 68 STAN. L. REV. 1263, 1303–04 (2016) (calling this the "lopsided-margins test").

[27] This difference may prove critical for partisan gerrymandering claims about congressional districts, because partisan bias (or

But in competitive states like Wisconsin, the differences are less important than the similarities. Figure 1, below, shows a hypothetical votes-to-seats curve, together with the quantities corresponding to the mean-median difference, and Gelman-King bias. As can be seen, the mean-median difference indicates the statewide two-party vote margin (from 50%) a party needs to control 50% of the seats, whereas Gelman-King bias indicates the seat margin that a party receives if it wins 50% of the vote. Indeed, the mean-median difference is equivalent to Gelman-King bias divided by the slope (responsiveness) of the votes-to-seats curve at the tied-election point. *See* Jackman, *Rucho*, Rebuttal Report, *supra*, at 8.

If one calculates the EG at these points in the seats-votes curve, the measures are almost perfect substitutes for each other. Gelman-King bias and the EG are mathematically identical when both parties have 50% of the vote, and when the median is 50% (giving both parties half the seats) the EG is precisely twice the mean-median difference. *See* McGhee, *Measuring Efficiency in Redistricting*, *supra*. Furthermore, it has been shown that the "average winner's margin difference" is mathematically identical to the EG under all conditions, not just at certain counterfactual points on the votes-to-seats curve. The bottom line is that, although the EG has distinct advantages as explained in Part I.B., all of these measures are closely related

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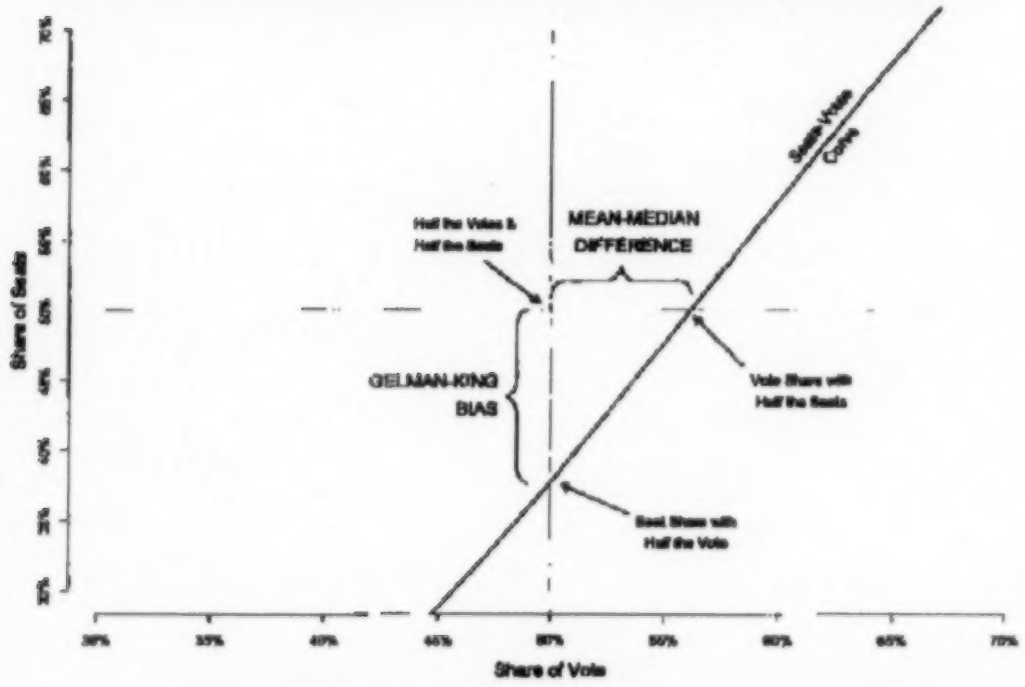
its absence) in Congress as a whole depends on redistricting decisions made in uncompetitive as well as competitive states. An additional seat for Congress is equally significant whether it comes from an uncompetitive state like California or Texas or a competitive one like North Carolina or Pennsylvania. *See* Stephanopoulos & McGhee, *supra*, at 861.

to one another, and indeed the EG can be used as a substitute for any of them if desired.

Figure 1. Illustration of Votes-to-Seats Curve, and Two Measures of Partisan Symmetry



B. Empirically, Little Turns on the Choice Among Symmetry Metrics in Competitive States Such as Wisconsin.

While the plaintiffs relied on the EG in this case, it's very unlikely that the trial court's finding that the Wisconsin map conferred a large, durable advantage on the Republican Party would have been any different had the plaintiffs instead used Gelman-King bias or the mean-median difference.

Simon Jackman has calculated Gelman-King bias and the EG for state legislative maps and congressional maps from 1972 to the present. He found that in competitive states (such as Wisconsin and North Carolina), the two measures are extremely highly correlated, but that they often diverge in uncompetitive

states. *See* Plaintiffs' Trial Brief at 29–31, *Whitford v. Gill*, 218 F.Supp.3d 837 (2016) (No. 15-cv-421-bbc) (discussing and illustrating state legislative findings); Jackman, *Rucho*, Rebuttal Report, *supra*, at 2–8, (reporting congressional findings). The divergence in uncompetitive states is not surprising; it reflects the speculative nature of projecting seat-shares at the 50% vote-share point in those states where one party consistently dominates the other, as explained in Part I.B.

Jackman also found the mean-median difference and Gelman-King bias to be highly correlated with one another, in both competitive and uncompetitive states. *See* Jackman, *Rucho*, Rebuttal Report, at 8. This correlation is also to be expected given the mathematical connection between the two measures noted above.

Amicus has calculated for this brief the EG, Gelman-King bias, and mean-median difference of the current Wisconsin assembly map for 2016. Despite widespread claims of a political transformation in Wisconsin in the 2016 presidential election, Republicans received just 52% of the two-party vote in the state's Assembly elections.[28] Republicans nonetheless turned this narrow margin into 65% of the seats. The EG for the election favored Republicans, and by a substantial 11 percentage points. Gelman-King bias (13%) and the mean-median difference (7%) also indicate that the map continues to favor Republicans.[29]

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[28] This is the vote share calculated with imputations for uncontested seats (i.e., estimating the parties' vote shares in these districts had the incumbent been challenged by a candidate of the other party).

[29] This is consistent with record evidence showing that, in Wisconsin, the EG and Gelman-King bias have been very closely correlated in competitive election years. See Brief of Plaintiffs

The bottom line is that, in Wisconsin and other competitive states a map that has been shown to be a "symmetry outlier" by one measure is also likely to be an outlier using the other metrics.[30]

CONCLUSION

Amicus hopes that the explanation of the Efficiency Gap provided in this brief will help this Court make an informed judgment about whether to employ the EG, alone or in conjunction with the larger family of partisan symmetry metrics, in determining the constitutionality of partisan gerrymanders.

Respectfully submitted,

CHRISTOPHER S. ELMENDORF
UNIVERSITY OF CALIFORNIA,
DAVIS SCHOOL OF LAW
400 Mrak Hall Drive
Davis, CA 95616
(530) 752-5756
cselmendorf@ucdavis.edu

DANIEL F. KOLB
Counsel of Record
LYNN E. BUSATH
JOHN HAMMOND HEATH
ELIZABETH A. TIPPETT
DAVIS POLK & WARDWELL LLP
450 Lexington Avenue
New York, NY 10017
(212) 450-4000
Daniel.Kolb@DavisPolk.com

Counsel for *Amicus Curiae* Eric McGee,
Public Policy Institute of California

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at 26–31, *Whitford v. Gill*, 218 F.Supp.3d 837 (2016) (No. 15-cv-421-bbc).

[30] That said, if one uses the EG, one can consider a wider range of states and historical periods when determining the level of bias sufficient to mark a map as an outlier. The reason is that the EG can be computed for any map in any state, whereas Gelman-King bias and the mean-median difference are applicable only to states in which the parties are pretty evenly matched.